STATE OF MISSOURI

# DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

# MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

| | |
|---|---|
| Permit No. | MO-0001848 |
| Owner: | The Doe Run Resources Corporation |
| Address: | 1801 Park 270 Drive, Suite 300, St. Louis, MO 63146 |
| Continuing Authority: | Same as above |
| Address: | Same as above |
| Facility Name: | Doe Run, Brushy Creek Mine/Mill |
| Address: | PO Box 500, Viburnum, MO 65566 |
| Legal Description: | See page 2 |
| Receiving Stream: | Tributary to Bills Creek (U) |
| First Classified Stream and ID: | West Fork Black River (P)(02755) |
| USGS Basin & Sub-watershed No.: | (11010007-020001) |

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

## FACILITY DESCRIPTION

See page 2

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

September 5, 2003
Effective Date

Stephen M. Mahfood, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

September 4, 2008
Expiration Date

Jim Hull, Director of Staff, Clean Water Commission

FACILITY DESCRIPTION (continued)

Outfall #001 - Non-coal Mining/Storm Water Runoff - SIC #1031
Pit dewatering/pond/storm water runoff.
Design flow is 5.82 MGD.
Actual flow is 4.5 MGD.

Outfalls #002 & #003 - Non-coal Mining/Storm Water Runoff - SIC #1031
Process water/pond/storm water runoff.
Design flow is 5.82 MGD.
Actual flow is dependent upon precipitation.

Outfall #004 - Non-coal Mining/Storm Water Runoff - SIC #1031
In-stream compliance point.

Legal Description

Outfall #001 - SE ¼, NE ¼, Sec. 27, T33N, R2W, Reynolds County
Outfall #002 - NW ¼, SW ¼, Sec. 23, T33N, R2W, Reynolds County
Outfall #003 - SW ¼, SE ¼, Sec. 22, T33N, R2W, Reynolds County
Outfall #004 - NE ¼, NE ¼, Sec. 3, T32N, R2W, Reynolds County

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS



The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

| OUTFALL NUMBER AND EFFLUENT PARAMETER(S) | UNITS | FINAL EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| Outfall #001 – Mine Dewatering Discharge | | | | | | |
| Flow | MGD | * | | * | once/week | 24 hr. estimate |
| Precipitation | inches | * | | * | once/daily | 24 hr. total |
| Hardness | mg/L | * | | * | once/month | grab |
| Total Suspended Solids | mg/L | 30 | | 20 | once/month | grab |
| Oil & Grease | mg/L | 15 | | 10 | once/month | grab |
| pH – Units | SU | ** | | ** | once/month | grab |
| Temperature | °F | Note 1 | | Note 1 | once/month | grab |
| Copper, Dissolved | mg/L | 0.084 | | 0.051 | once/month | grab |
| Copper, Total Recoverable | mg/L | * | | * | once/month | grab |
| Lead, Dissolved | mg/L | 0.295 | | 0.181 | once/month | grab |
| Lead, Total Recoverable | mg/L | * | | * | once/month | grab |
| Zinc, Dissolved | mg/L | 1.621 | | 0.99 | once/month | grab |
| Zinc, Total Recoverable | mg/L | 1.5 | | 0.75 | once/month | grab |
| Cadmium, Dissolved | mg/L | 0.094 | | 0.057 | once/month | grab |
| Cadmium, Total Recoverable | mg/L | * | | * | once/month | grab |

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE October 28, 2003.

| | | | | | | |
|---|---|---|---|---|---|---|
| Mercury, Total Recoverable | mg/L | 0.0024 | | 0.0012 | once/year | grab |
| Whole Effluent Toxicity (WET) Test | % Survival | See Special Conditions | | | once/year in July | grab |

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE October 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

## B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Part I STANDARD CONDITIONS DATED October 1, 1980, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

**A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**



The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

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|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| Outfalls #002 & #003 – Process Water | | | | | | |
| Flow | MGD | * | | * | once/week | 24 hr. estimate |
| Precipitation | inches | * | | * | once/daily | 24 hr. total |
| Hardness | mg/L | * | | * | once/month | grab |
| Total Suspended Solids | mg/L | 30 | | 20 | once/month | grab |
| Oil & Grease | mg/L | 15 | | 10 | once/month | grab |
| pH – Units | SU | ** | | ** | once/month | grab |
| Temperature | °F | Note 1 | | Note 1 | once/month | grab |
| Copper, Dissolved | mg/L | 0.084 | | 0.051 | once/month | grab |
| Copper, Total Recoverable | mg/L | * | | * | once/month | grab |
| Lead, Dissolved | mg/L | 0.295 | | 0.181 | once/month | grab |
| Lead, Total Recoverable | mg/L | * | | * | once/month | grab |
| Zinc, Dissolved | mg/L | 1.621 | | 0.99 | once/month | grab |
| Zinc, Total Recoverable | mg/L | 1.5 | | 0.75 | once/month | grab |
| Cadmium, Dissolved | mg/L | 0.094 | | 0.057 | once/month | grab |
| Cadmium, Total Recoverable | mg/L | * | | * | once/month | grab |
| Cyanide, Amenable to Chlorination | mg/L | * | | * | once/month | grab |
| Chromium, Dissolved | mg/L | * | | * | once/month | grab |
| Chromium, Total Recoverable | mg/L | * | | * | once/month | grab |
| MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE October 28, 2003. | | | | | | |
| Mercury, Total Recoverable | mg/L | 0.0024 | | 0.0012 | once/year | grab |
| Whole Effluent Toxicity (WET) Test | % Survival | See Special Conditions | | | once/year in July | grab |
| MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE October 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS. | | | | | | |

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| OUTFALL NUMBER AND EFFLUENT PARAMETER(S) | UNITS | FINAL EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| Outfall #004 - Downstream Monitoring Point – Confluence of Bills Creek with West Fork Black River. Approximate location 37.49778 – 91.1493. | | | | | | |
| Flow | MGD | * | | * | once/week | 24 hr. estimate |
| Hardness | mg/L | * | | * | once/month | grab |
| pH – Units | SU | *** | | *** | once/month | grab |
| Temperature | °F | Note 1 | | Note 1 | once/month | grab |
| Copper, Dissolved | mg/L | 0.047 | | 0.029 | once/month | grab |
| Lead, Dissolved | mg/L | 0.417 | | 0.255 | once/month | grab |
| Zinc, Dissolved | mg/L | 0.557 | | 0.340 | once/month | grab |
| Cadmium, Dissolved | mg/L | 0.019 | | 0.012 | once/month | grab |
| Mercury, Total Recoverable | mg/L | * | | * | once/month | grab |
| Cyanide, Amenable to Chlorination | mg/L | * | | * | once/month | grab |
| Chromium, Total Recoverable | mg/L | * | | * | once/month | grab |

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE October 28, 2003. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

**B. STANDARD CONDITIONS**

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Part I STANDARD CONDITIONS DATED October 1, 1980, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.



A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.
*** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.

Note 1 – Runoff from this facility shall not elevate or depress the temperature of the receiving stream more than 5°F at the edge of the mixing zone. In addition, receiving waters shall not exceed 90°F at any time due to runoff from Outfalls #001 - #003.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.

4. Report as no-discharge when a discharge does not occur during the report period.

5. General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

   (a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
   (b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
   (c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
   (d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
   (e) There shall be no significant human health hazard from incidental contact with the water;
   (f) There shall be no acute toxicity to livestock or wildlife watering;
   (g) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
   (h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

6. Rainfall shall be monitored daily and the results shall be submitted with the Monthly Discharge Monitoring Report.

C. SPECIAL CONDITIONS (continued)

7. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:
(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
  (1) One hundred micrograms per liter (100 µg/L);
  (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
  (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
  (4) The level established in Part A of the permit by the Director.
(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

8. Whole Effluent Toxicity (WET) tests will be conducted as follows:

| SUMMARY OF WET TESTING FOR THIS PERMIT | | | | |
|---|---|---|---|---|
| OUTFALL | A.E.C. % | FREQUENCY | SAMPLE TYPE | MONTH |
| Outfalls #001 - #003 | 100% | Annually | Grab | July |

a. Test Schedule and Follow-Up Requirements

(1) **Perform a multiple-dilution test** in the months and at the frequency specified above.

If the test passes the effluent limit do not repeat test until the next test period. Submit results with the annual report.

If the test fails the effluent limit additional multiple dilution tests shall be performed within 14 days, and biweekly thereafter until one of the following conditions are met:

(a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
(b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(2) The permittee shall submit a summary of all test results for the test series to the Planning Section of the WPCP, DNR, Box 176, Jefferson City, MO within 14 days of the third failed test. DNR will contact the permittee with initial guidance on conducting a toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE). The permittee shall submit a plan for conducting a TIE or TRE to the Planning Section of the WPCP within 60 days of the date of DNR's letter. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.

(3) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.



C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) (continued)

a. Test Schedule and Follow-Up Requirements (continued)

(4) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in part b.(1) will be required during this period.

(5) In addition to the WET test summary report required in part (2), all failing test results shall be reported to DNR within 14 days of the availability of results.

(6) All WET test results for the reporting period shall be summarized and submitted to DNR by the end of the following October. When WET test sampling is required to run over one DMR period, each DMR report shall contain information generated during the reporting period.

(7) In the event that the steps set forth above are followed to the point of completion of a TIE/TRE that has been reviewed and approved by the DNR, Doe Run will complete all construction/installation of pollution control measures necessary such that the effluent is of sufficient quality to “pass” multiple dilution WET tests using biological test species denoted in the permit within three of the date of approval of the TIE/TRE.

b. PASS/FAIL procedure and effluent limitations

(1) To pass a multiple-dilution test:

(a) the computed percent effluent at the edge of the zone of initial dilution (AEC) must be less than three-tenths (0.3) of the $LC_{50}$ concentration for the most sensitive of the test organisms, or,

(b) all dilutions equal to or greater than the AEC must be nontoxic. After June 24, 2005, failure of one multiple-dilution test is considered an effluent limit violation.

c. Test Conditions

(1) Test species: Ceriodaphnia dubia and fathead minnows, Pimephales promelas. Organisms used in WET testing should come from cultures reared for the purpose of conducting toxicity tests and should be cultured in a manner consistent with the most current USEPA guidelines. All test animals should be cultured as described in EPA-600/4-90/027.

(2) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

(3) When dilutions are required, upstream receiving stream water will be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used. Procedures for generating reconstituted water will be supplied by the Department of Natural Resources (DNR).

(4) Tests should be initiated immediately after the sample is collected, but tests must be initiated no later than 36 hours after collection.



C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) (continued)

c. Test Conditions (continued)

(5) Multiple-dilution tests will be run with:
(a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and ¼ AEC.
(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
(c) reconstituted water.

(6) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

9. Industrial Sludge Disposal

a. Disposal of industrial sludge is not authorized by this permit. Industrial sludge shall be disposed at a permitted solid waste disposal facility in accordance with 10 CSR 80; or if the sludge is determined to be hazardous waste, shall be disposed at a permitted hazardous waste disposal facility pursuant to 10 CSR 25.
b. Non-hazardous sludge that is disposed on site or that is exempted under 10 CSR 80 must obtain applicable permits under 10 CSR 20-6.015 and 10 CSR 20-6.200.
c. Each effluent monitoring report shall also specify the date any sludge is removed from the facility, who removed the sludge and the number of gallons or quantity of sludge removed. The final disposal location shall be reported, including the name of the disposal facility, the solid waste or hazardous waste disposal permit number, and date of permit issuance.
d. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act.

10. Outfalls #002 and #003 shall be operated and maintained to contain maximum daily flows and the runoff from a 10-year, 24-hour rainfall. There will normally be no discharge from Outfalls #002 and #003 except when the precipitation exceeds the 10-year, 24-hour amount or other circumstances exist as outlined in the preamble to the Ore Mining and Dressing Effluent Limitation Guideline (Federal Register Volume 47 Number 233, Friday, December 3, 1982). Any discharge shall meet the limitations as noted unless conditions (a) through (c) are met; in which case there is a monitoring only requirement.

a. The facility is designed, constructed and maintained to contain the maximum volume of wastewater stored and contained by the facility during normal operating conditions without an increase in volume from precipitation and the maximum volume of wastewater resulting from a 10-year, 24-hour precipitation event. In computing the maximum volume of wastewater which would result from a 10-year, 24-hour precipitation event, the facility must include the volume which would result from all areas contributing runoff to the individual treatment facility, i.e., all runoff that is not diverted from the area or process subject to zero discharge, and other runoff that is allowed to commingle with the influent to the treatment system.
b. The facility takes all reasonable steps to minimize the overflow or excess discharge.

c. The facility complies with the notification requirements of S122.60(g) and (h). The storm exemption is designed to provide an affirmative defense to an enforcement action. Therefore, the operator has the burden of demonstrating to the appropriate authority that the above conditions have been met.



**SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS**

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless otherwise specified by MDNR, procedures should be consistent with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA/600/4-90/027.

Test conditions for Ceriodaphnia dubia:

| | |
|---|---|
| Test duration: | 48 h |
| Temperature: | 25 ± 2°C |
| Light Quality: | Ambient laboratory illumination |
| Photoperiod: | 16 h light, 8 h dark |
| Size of test vessel: | 30 mL (minimum) |
| Volume of test solution: | 15 mL (minimum) |
| Age of test organisms: | <24 h old |
| No. of animals/test vessel: | 5 |
| No. of replicates/concentration: | 4 |
| No. of organisms/concentration: | 20 (minimum) |
| Feeding regime: | None (feed prior to test) |
| Aeration: | None |
| Dilution water: | Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness. |
| Endpoint: | Mortality (Statistically significant difference from upstream receiving water control at $p \leq 0.05$) |
| Test acceptability criterion: | 90% or greater survival in controls |

Test conditions for (Pimephales promelas):

| | |
|---|---|
| Test duration: | 48 h |
| Temperature: | 25 ± 2°C |
| Light Quality: | Ambient laboratory illumination |
| Photoperiod: | 16 h light/ 8 h dark |
| Size of test vessel: | 250 mL (minimum) |
| Volume of test solution: | 200 mL (minimum) |
| Age of test organisms: | 1-14 days (all same age) |
| No. of animals/test vessel: | 10 |
| No. of replicates/concentration: | 4 (minimum) single dilution method<br>2 (minimum) multiple dilution method |
| No. of organisms/concentration: | 40 (minimum) single dilution method<br>20 (minimum) multiple dilution method |
| Feeding regime: | None (feed prior to test) |
| Aeration: | None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min. |
| Dilution water: | Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness. |

| | |
|---|---|
| Endpoint: | Mortality (Statistically significant difference from upstream receiving water control at $p \leq 0.05$) |
| Test Acceptability criterion: | 90% or greater survival in controls |